

Treatment of Abdominal Skin Laxity with the Titan XL Infrared Light Source

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Abstract:

Background and Objectives: Treatment of abdominal skin laxity has traditionally been done with abdominoplasty. This study was undertaken to determine if improvement of visibly wrinkled abdominal skin could be achieved with a noninvasive technique. **Study Design/Materials and Methods:** 11 female subjects with visible skin laxity of the abdomen were enrolled in an IRB-approved study. Subjects received two treatments, one month apart, with the Titan XL. The device emits light in the near infrared range to provide sustained dermal heating. Improvement was determined by independent evaluation of photographs taken before the initial treatment and at each follow-up visit (1, 3, and 6 months post-treatment). The wrinkled area and lax skin surrounding it were treated with four passes. An average of 284 pulses was applied at each visit. Treatment fluences ranged from 34 to 43 J/cm². **Results:** Seven of the 11 patients have completed the study through the 6 month follow-up period. Ten have completed treatment and photos through the 3 month mark. Of the total, 1 patient had marked improvement, 3 patients had moderate improvement, 4 had mild improvement, and 3 had no improvement. No adverse effects were seen. Interestingly, the degree of improvement was strongly inversely proportional to the degree of abdominal striae. All patients without striae had marked or moderate improvement. **Conclusions:** The Titan XL is a safe and effective modality for treating abdominal skin laxity in properly selected patients.

Introduction:

Effective noninvasive skin tightening is the holy grail for dermatologists. Many reports of successful treatment of facial skin laxity exist, however there is scarce data regarding the effectiveness of these modalities on nonfacial skin. Abdominoplasty remains the only proven treatment for patients with redundant, lax abdominal skin, usually seen postpartum or after significant weight loss. In this era of noninvasive procedures, patients and their physicians are looking for effective nonsurgical options.

The Titan device was the first light-based device to effectively treat lax skin. The device emits infrared light from 1100 to 1800 nm through a 1 x 3 cm chilled sapphire window to provide sustained volumetric dermal heating. The light is highly absorbed by water in the dermis at a depth of 1 to 3 mm. This sustained dermal heating has been shown to cause immediate collagen contraction as well as neocollagenesis, a well known delayed response to a thermal wound in the dermis. This study was undertaken to determine if the Titan device could effectively treat and thereby improve the wrinkled appearance of redundant, lax abdominal skin.

Material and Methods:

Eleven patients with visible abdominal skin laxity and wrinkling were enrolled in an IRB-approved study. Subjects had to be at least one year postpartum. Standardized photographs were taken prior to treatment as well as at the 1, 3, and 6 month follow-up visits. Patients were marked while upright to delineate the treatment areas. The treated area included the immediately wrinkled skin as well as a band of skin above, and occasionally below, the wrinkles. The additional treatment area was determined by gently tugging on the skin to assess whether a "lift" of that skin would result in a diminution of the wrinkles. The total treatment area was then divided into quadrants. Each quadrant was treated with four passes at energies ranging from 34-43 J/cm². Initial treatment energies were chosen by the treating physician (36-38 J/cm²) and increased or decreased according to the patient's tolerance. No anesthesia or sedation was necessary during treatment sessions. The average number of pulses per treatment was 284 (range from 120 to 412). Pulses were placed immediately adjacent to one another. If necessary, the skin was pulled taut with the nondominant hand to ensure a flat surface that would

allow for good contact between the skin and treatment tip. Refrigerated ultrasound gel was used to ensure good epidermal cooling as well as to enhance patient comfort. Patients received two treatments, one month apart.

An independent observer rated the 1, 3, and 6 month post-treatment photos for evidence of improvement using a four point scale where 0 = no improvement, 1= mild improvement, 2 = moderate improvement and 3 = marked improvement. Pre-treatment photos were also rated for the degree of striae distensae in the involved area.

Results:

All 11 patients completed the treatment protocol, although 3 and 6 month follow-up data is still pending for one patient and 6 month follow-up results are still pending for 4 patients. After one month, 4 patients (36 %) showed mild improvement, 3 (27%) demonstrated moderate improvement, 1 patient (9%) had marked improvement and 3 (27%) had no improvement. Of the patients who had improvement at the one month visit, all but two sustained the same level of improvement at both the 3 month and 6 month follow-up visits. Of these two exceptions, one had moderate striae and one had marked striae. When patients with moderate to marked striae were eliminated from the calculations, 100% (5/5) of the treated patients responded and 80% (4/5) had either moderate or marked improvement. Erythema and mild edema were seen immediately post-treatment. No adverse effects were seen.

Discussion:

A nonsurgical treatment that can effectively and reliably treat wrinkled, lax skin is needed. Nonsurgical skin tightening devices have shown great promise for treating lax facial skin. However, the results are not always consistent, and the factors that may help predict success or failure have not been fully elucidated. Our results suggest that the treatment of wrinkled, lax abdominal skin with the Titan XL device is safe and effective. We were also able to elucidate at least one factor, the presence of significant striae, that is negatively related to treatment outcome. This is extremely helpful in regards to patient consultations, allowing physicians to more accurately predict which patients will have a positive response to treatment. Our study is limited by its small size, but it is a promising start. Additional studies are warranted.

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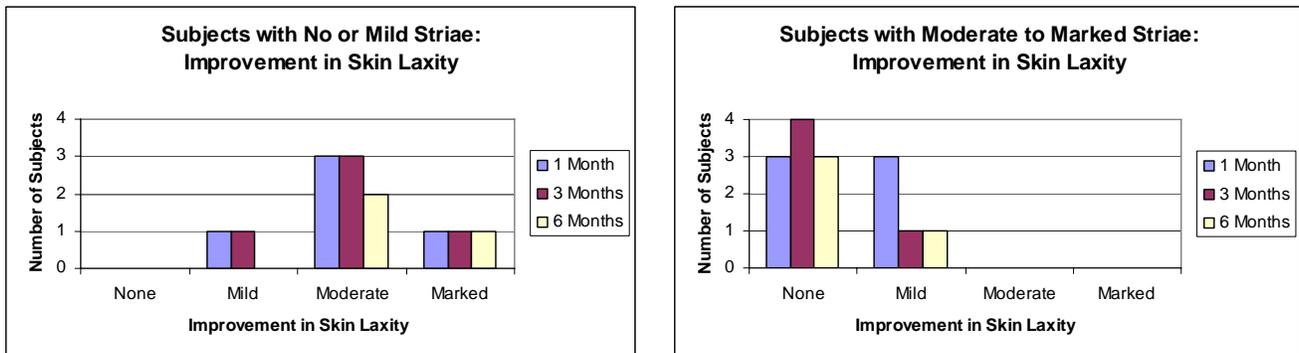


Figure 1. Improvement in skin laxity at 1, 3, and 6 months after the second treatment a) for subjects with no or mild striae, and b) for subjects with moderate to marked striae. Significant striae appears to be negatively related to treatment outcome.



Figure 2. Results of treatment of a 39-year-old female treated two times separated by 5 weeks. a) pre-treatment, b) 3 months after the second treatment and c) 6 months after the second treatment. This subject was rated as having moderate improvement at each follow-up visit.



Figure 3. Results of treatment of a 57-year-old female treated two times separated by 4 weeks. a) pre-treatment and b) 3 months after the second treatment. This subject was rated as having moderate improvement at two completed follow-up visits.



Figure 4. Results of treatment of a 34-year-old female treated two times separated by 4 weeks. a) pre-treatment and b) 3 months after the second treatment. This subject was rated as having mild improvement at each follow-up visit.



Figure 5. Results of treatment of a 39-year-old female treated two times separated by 4 weeks. a) pre-treatment, b) 3 months after the second treatment and c) 6 months after the second treatment. This subject was rated as having moderate improvement at each follow-up visit.



Figure 6. Results of treatment of a 44-year-old female treated two times separated by 4 weeks. a) pre-treatment, b) 3 months after the second treatment and c) 6 months after the second treatment. This subject was rated as having marked improvement at each follow-up visit.



Figure 7. Immediate erythema reaction to treatment of the 44-year-old subject whose results are shown in Figure 6. a) pre-treatment and b) immediately post-treatment. The area to be treated was marked out in advance using a white pencil.